CTEH® CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

Mission Incident
Santa Paula, CA
Preliminary Summary of Air Monitoring Results
November 28, 2014

Prepared by
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CTEH® CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

Introduction

Center for Toxicology and Environmental Health, LLC (CTEH®) continued air monitoring in support of response activities following a vac truck explosion and fire in Santa Paula, CA.

This submittal summarizes air monitoring data for November 28, 2014 07:00 to November 29, 2014 07:00.

Real-time Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Manually-logged real-time air monitoring was conducted for chlorine (Cl_2), hydrogen sulfide (H_2S), percent of the Lower Explosive Limit (LEL), oxygen (O_2), peroxides, sulfur dioxide (SO_2), sulfuric acid (H_2SO_4), particulate matter (10-micron particles, PM_{10}), and volatile organic compounds (VOCs), with instruments such as Gastec® pumps with chemical-specific colorimetric tubes, RAESystems® MultiRAE Plus and MultiRAE Pro PID with chemical-specific sensors, and TSI® AM510s for particulate matter. Monitoring was conducted by CTEH® personnel in the work area, at fixed locations in the surrounding community, and along the perimeter of the facility in the community. Table 1 summarizes monitoring data for manually-logged real-time readings. Maps including the site location, fixed community real-time air monitoring locations, aerial site photo, and roaming monitoring are included in Appendix A.

CTEH® monitored RAESystems© AreaRAE units with ProRAE Guardian system at four locations on the fence line of the facility within the work area. AreaRAEs were equipped with sensors to detect VOCs, LEL, H_2S, and SO_2. Table 2 summarizes monitoring data for AreaRAE monitoring. AreaRAE graphs displaying real-time air monitoring data as well as 15-minute rolling averages and a map depicting AreaRAE locations are included in Appendix B.

Additional particulate monitoring was conducted around the facility perimeter within the work area. TSI AM510 SidePak aerosol monitors equipped with 10-micron impactors were collocated with the AreaRAE units. Unit 10408088 at location AR04 was taken out of service for maintenance due to sensor drift and replaced with unit 10408087. Handheld monitors were used to verify that PM_{10} concentrations on the original unit up to 19.998 mg/m^3 were not accurately reflecting atmospheric conditions. Table 3 summarizes monitoring data for data-logged AM510 units.

Table 1: Manually-Logged Real-Time Air Monitoring Summary[1]
November 28, 2014 07:00 – November 29, 2014 07:00

Location Category	Analyte	Instrument	No. of Readings	No. of Detections	Avg. of Detections	Concentration Range
Community	Cl_2	MR+ / MR Pro	25	0	NA	<0.1 ppm
	LEL	MR+ / MR Pro	25	0	NA	<1 %
	O_2	MR+ / MR Pro	26	26	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	25	0	NA	<0.1 ppm
	PM_{10}	AM510/Dusttrak	25	25	0.013	0.002 - 0.027 mg/m^3
	SO_2	MR+	25	0	NA	<0.1 ppm
	H_2SO_4	Gastec 35	24	0	NA	<0.2 mg/m^3
	VOC	MR+ / MR Pro	25	0	NA	<0.1 ppm
Exclusion Zone	H_2S	MR+ / MR Pro	1	0	NA	<0.1 ppm
	Peroxides	Gastec 32	1	0	NA	<0.1 ppm
	H_2SO_4	Gastec 35	1	0	NA	<0.2 mg/m^3
Work Area	Cl_2	MR+ / MR Pro	14	0	NA	<0.1 ppm
	H_2S	MR+ / MR Pro	12	0	NA	<0.1 ppm
	LEL	MR+ / MR Pro	4	0	NA	<1 %
	O_2	MR+ / MR Pro	5	5	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	1	0	NA	<0.1 ppm
	SO_2	MR+	5	0	NA	<0.1 ppm
	H_2SO_4	Gastec 35	2	0	NA	<0.2 mg/m^3
	VOC	MR+ / MR Pro	16	0	NA	<0.1 ppm

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*
[2]*Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.*

Table 2: AreaRAE Air Monitoring Summary[1]
November 28, 2014 07:00 – November 29, 2014 07:00

Unit ID	Analyte	No. of Readings	No. of Detections	Avg. of Detections	Detection Range
Unit 01	H_2S	5529	1965	0.3 ppm	0.1 - 0.7 ppm
	LEL	5529	0	NA	< 1 %
	SO_2	5529	0	NA	< 0.1 ppm
	VOC	5529	34	0.1 ppm	0.1 - 0.4 ppm
Unit 02	H_2S	5650	2602	0.2 ppm	0.1 - 0.6 ppm
	LEL	5650	0	NA	< 1 %
	SO_2	5650	116	0.1 ppm	0.1 - 0.1 ppm
	VOC	5650	401	0.1 ppm	0.1 - 0.2 ppm
Unit 03	H_2S	5419	380	0.1 ppm	0.1 - 0.3 ppm
	LEL	5419	0	NA	< 1 %
	SO_2	5419	0	NA	< 0.1 ppm
	VOC	5419	24	0.1 ppm	0.1 - 0.1 ppm
Unit 04	H_2S	5666	1429	0.2 ppm	0.1 - 0.4 ppm
	LEL	5666	0	NA	< 1 %
	SO_2	5666	0	NA	< 0.1 ppm
	VOC	5666	1	0.1 ppm	0.1 - 0.1 ppm

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*
[2]*Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.*

Table 3: Data-logged AM510 Particulate (PM_{10}) Monitoring Summary[1]
November 28, 2014 07:00 – November 29, 2014 07:00

Serial No.	Location	No. of Readings	No. of Detections	Avg. Detection	Detection Range
10704069	AR01	5083	5083	0.014	0.002 - 0.113 mg/m^3
10704074	AR02	5682	5595	0.016	0.001 - 0.211 mg/m^3
10704072	AR03	5662	5455	0.014	0.001 - 0.908 mg/m^3
10408087	AR04	2211	2211	0.033	0.004 - 0.969 mg/m^3
[2]10408088		2340	1017	2.863	0.003 - 19.998 mg/m^3

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*
[2]Unit 10408088 at location AR04 was taken out of service for maintenance due to sensor drift and replaced with unit 10408087

Appendix A

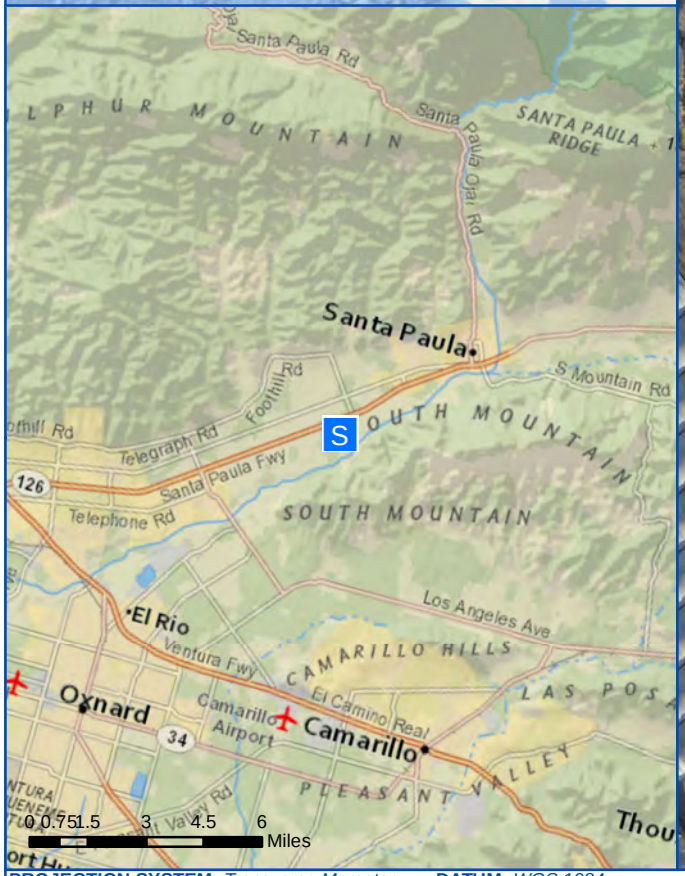
Incident Maps:

Real-time Air Monitoring Locations and Incident Site

Site Location

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura



PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *11/25/2014 9:42:14 AM*

Aerial Overview - 11/27/2014

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *11/28/2014 12:07:39 PM*

Manually Logged Real-Time Air Monitoring Concentrations

VOC - Nov 28, 2014 07:00 to Nov 29, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/29/2014 7:49:45 AM*

Manually Logged Real-Time Air Monitoring Concentrations

H_2SO_4 - Nov 28, 2014 07:00 to Nov 29, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/29/2014 8:06:40 AM*

Manually Logged Real-Time Air Monitoring Concentrations

SO_2 - Nov 28, 2014 07:00 to Nov 29, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/29/2014 7:51:47 AM*

Manually Logged Real-Time Air Monitoring Concentrations

PM_{10} - Nov 28, 2014 07:00 to Nov 29, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *11/29/2014 8:09:43 AM*

Manually Logged Real-Time Air Monitoring Concentrations

Peroxides - Nov 28, 2014 07:00 to Nov 29, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/29/2014 8:08:24 AM*

Manually Logged Real-Time Air Monitoring Concentrations

O_2 - Nov 28, 2014 07:00 to Nov 29, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *11/29/2014 7:50:56 AM*

Manually Logged Real-Time Air Monitoring Concentrations

LEL - Nov 28, 2014 07:00 to Nov 29, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/29/2014 7:57:11 AM*

Manually Logged Real-Time Air Monitoring Concentrations

H_2S - Nov 28, 2014 07:00 to Nov 29, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/29/2014 8:10:13 AM*

Manually Logged Real-Time Air Monitoring Concentrations

Cl_2 - Nov 28, 2014 07:00 to Nov 29, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/29/2014 8:07:47 AM*

Appendix B:

AreaRAE Trend Graphs, AM510 Trend Graphs, and AreaRAE/AM510 Air Monitoring Location Map

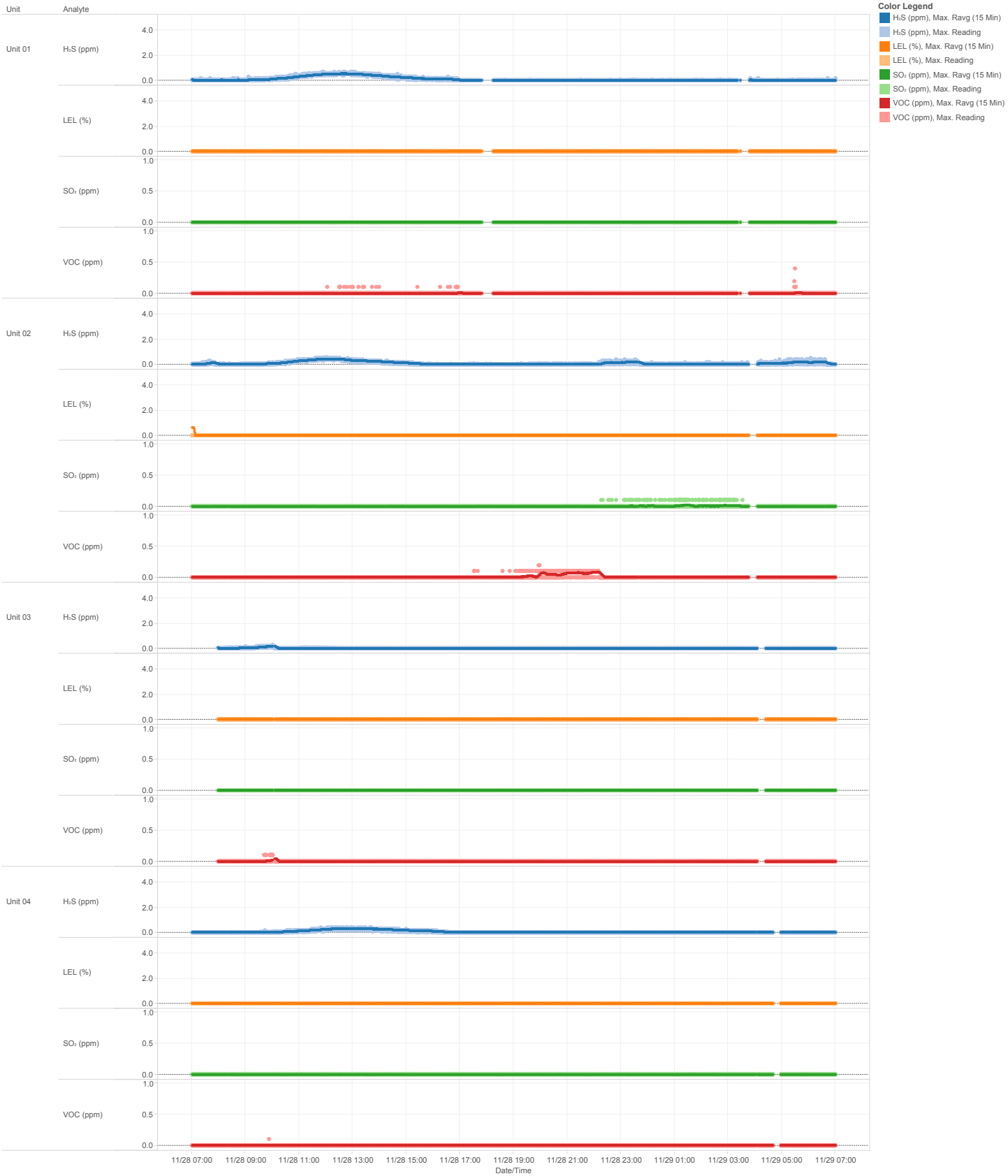
AreaRAE and AM510 Locations

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

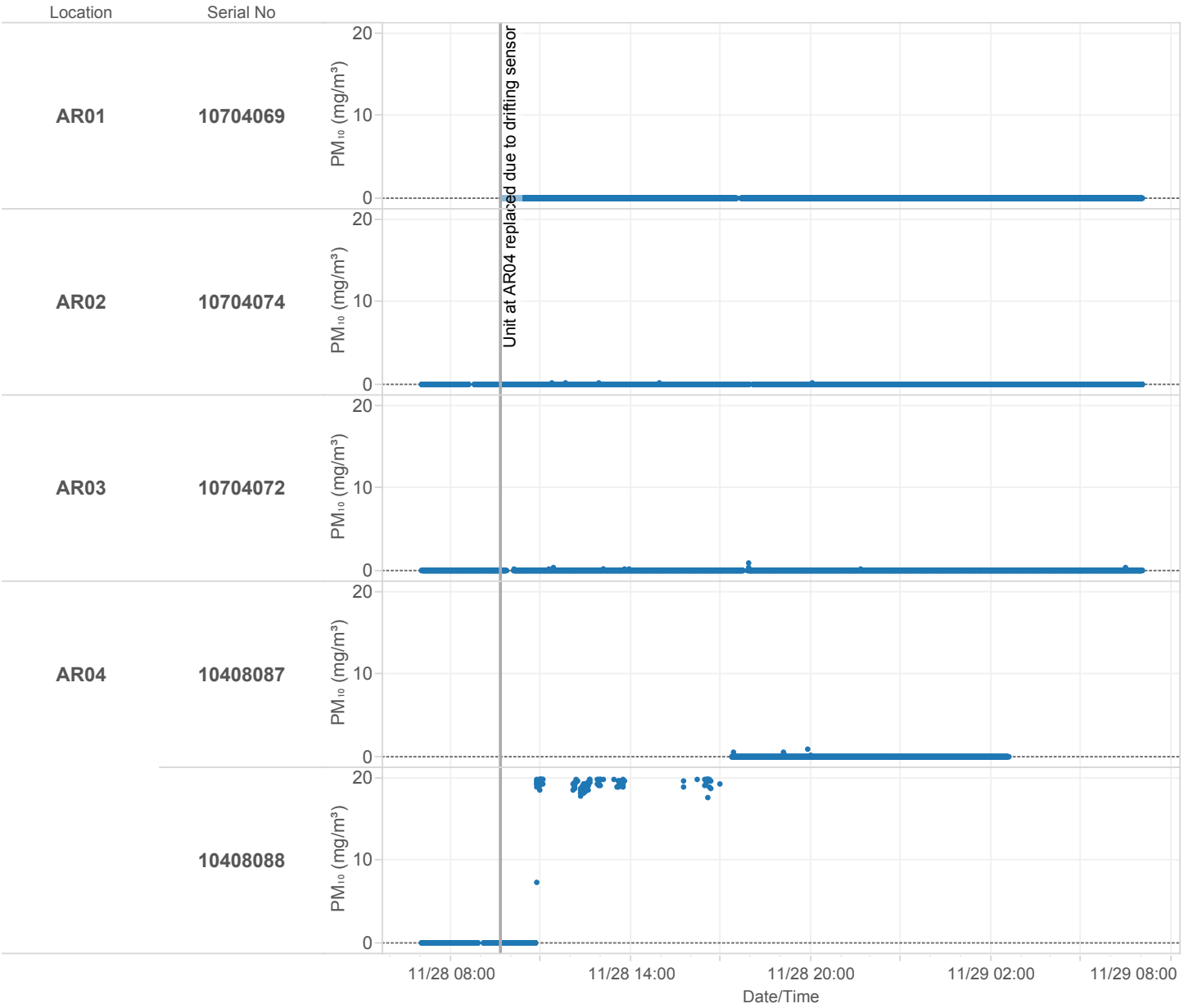
PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *11/26/2014 11:37:30 AM*

Patriot Environmental
AreaRAE Trend Graphs
11/28/2014 07:00 - 11/29/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
MISSION INCIDENT
Datalogged AM510 (PM_{10}) Summary
11/28/2014 07:00 - 11/29/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format